United States Department of Agriculture Grain Inspection, Packers and Stockyards Administration Federal Grain Inspection Service

# **FGIS Issuance Change**

CHANGE TO	$\triangle$	DIRECTIVE	riangle manual	★ HANDB	★ HANDBOOK	
CHANGE NO. 2	TO (No.)	TITLE Pea and Lent	il Handbook		DATE: 12/31/02	

#### PURPOSE OF CHANGE

This Issuance Change transmits revisions to Chapter 7, "Dockage-Free Lentils", of the Pea and Lentil Handbook (Reference: 67 FR 30354). It adds the term and definition for "immature lentils" to damaged lentils (section 7.20); adds the term and definition for "contrasting lentils" (section 7.23); changes the definitions for "good color lentils" and "fair color lentils", and adds the term and definition for "poor color lentils" (section 7.27). This revision also changes the minimum requirements for color for U.S. No. 3 from "Fair" to "Poor"; and revises the attachment, "Grades, and Grade Requirements for Dockage-free Lentils", to reflect these changes. It also corrects other miscellaneous typographical errors and formatting.

#### FILING INSTRUCTIONS

Remove Pages	<u>Dated</u>	<u>Insert Pages</u>	<u>Dated</u>
Chapter 7	8-1-98	Chapter 7	12-31-02
Attachment	8-1-98	Attachment	12-31-02

Retain issuance change sheet as an aid in verifying handbook content.

/s/ David Orr David Orr, Director Field Management Division

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U.S. DEPARTMENT OF AGRICULTURE Grain Inspection, Packers and Stockyards Administration Federal Grain Inspection Service PEA AND LENTIL HANDBOOK Chapter 7 Dockage-Free Lentils 12/31/02

# CHAPTER 7

# DOCKAGE-FREE LENTILS

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#### 7.1 **DEFINITIONS**

<u>Dockage-Free Lentils.</u> Lentils from which the dockage has been removed.

<u>Lentils</u>. Threshed seeds of the lentil plant (Lens culinaris Moench), which after removal of the dockage, contain 50.0 percent or more of whole lentils and not more than 10.0 percent foreign material.

## 7.2 GRADES AND GRADE REQUIREMENTS

The grades and grade requirements for the class Lentils are shown in the United States Standards for Lentils, Section 601, and in Attachment 1, "Grades and Grade Requirements for Dockage-Free Lentils," to this chapter.

## 7.3 SPECIAL GRADES AND SPECIAL GRADE REQUIREMENTS

- a. The special grade and special grade requirements of the class Lentils are shown in the United States Standards for Lentils (section 609).
- b. A special grade, when applicable, is supplemental to the grade assigned. Such special grades for lentils are defined as follows:
  - (1) <u>Large Lentils</u>. Lentils of which not more than 3.0 percent will readily pass through a 15/64-inch round-hole sieve.
  - (2) <u>Small Lentils</u>. Lentils of which 95 percent or more will readily pass through a 15/64-inch round-hole sieve, not less than 80 percent will readily pass through a 12/64-inch round-hole sieve, and not more than 3.0 percent will readily pass through a 9/64-inch round-hole sieve.

#### 7.4 WORK RECORD

Record the results of all tests and findings clearly and accurately on a laboratory ticket or similar form. This will be used as the source of the information reported on the inspection certificate. FGIS personnel shall use form FGIS-981, "Pea and Lentil Laboratory Ticket" or form FGIS-982, "Pea and Lentil Sample Ticket." Cooperators shall use a similar form.

#### 7.5 REPRESENTATIVE PORTION

A specified quantity of lentils divided out from the representative sample (refer to Chapter 2) by means of an FGIS approved device.

#### 7.6 WORK SAMPLE

A representative portion of lentils (approximate size - 1,000 grams) that is used to make all determinations required for the class Lentils.

#### 7.7 FILE SAMPLE

- a. A representative portion of lentils (approximate size 1,000 grams) that is maintained for a specified period of time and that may also be used for monitoring, retest, and appeal inspection purposes. (File samples may be used in conjunction with the work sample, when needed.)
- b. Retain file samples in appropriate containers for the required retention period. After maintaining for the required period, dispose of the file samples in accordance with established procedures. See FGIS Directive 9170.13, "Uniform File Sample Retention System," for additional information.

#### 7.8 PERCENTAGES

- a. Percentages are determined on the basis of weight and are rounded as follows:
  - (1) When the figure to be rounded is followed by a figure greater than or equal to 5, round to the next higher figure; e.g., report 6.36 as 6.4, 0.35 as 0.4, and 2.45 as 2.5.
  - (2) When the figure to be rounded is followed by a figure less than 5, retain the

figure; e.g., report 8.34 as 8.3 and 1.22 as 1.2.

b. All percentages shall be stated in whole and tenth percent to the nearest tenth percent.

#### 7.9 LABORATORY SCALES

Weigh work portions and separations from work portions using an approved grain test scale with an appropriate division size. See Equipment Handbook, Chapter 2.

#### 7.10 PRELIMINARY EXAMINATION

- a. The sampler must observe the uniformity of the lentils as to class, quality, and condition, which includes making the determination for "Heating", and making preliminary determinations for infestation and odor; draw the representative sample; and report relevant information to the inspector.
- b. The inspector must review the sampler's remarks/information when determining the representativeness of the sample. If the inspector suspects the sample is not representative, the inspector should consult with the sampler and, if necessary, dismiss the inspection or arrange to obtain another sample.

## 7.11 BASIS OF DETERMINATIONS

- a. Color shall be determined after the removal of dockage, defective lentils, and foreign material.
  - (1) Dockage shall be determined upon the basis of the thresher-run lentils as sampled.
  - (2) Color shall be determined after removal of dockage, defective lentils, and foreign material.

b. Defects in lentils shall be scored in accordance with the order shown in section 601(c); and once an individual lentil is scored in a defective category it shall not be scored for any other defect but it shall remain as a part of the sample for purposes of determining the percentage of defects in the sample.

#### 7.12 ORDER OF PROCEDURES

Follow a systematic factor examination procedure. The order of procedure may vary depending on the quality of the lentils and the tests that are requested. A general order of procedure is as follows:

- (1) Review the information on the sample ticket.
- (2) Use an FGIS approved divider to process the representative sample into two representative portions: a work sample and a file sample.
- (3) Examine the work sample for infestation, odor, broken glass, and metal fragments.
- (4) When necessary, sieve the work sample to determine if the lentils meet the size requirements for "large lentils" or "small lentils."
- (5) When needed, divide out a dockage-free portion and determine the percent of moisture.
- (6) Divide out approximately a 60-gram portion for small seeded lentils or a 125-gram portion for large seeded lentils, and determine the percent of defective lentils, foreign material, and other pertinent grading factors.
- (7) After removing the defective lentils and foreign material from the portion, examine the "clean" portion for color.

#### 7.13 INSECT INFESTATION

a. Determine infestation on the basis of the work sample as a whole, a representative portion of approximately 60-gram for small seeded lentils or a 125-gram portion for large seeded lentils, and the lot as a whole.

- (1) Perform a cursory examination of the work sample. If two or more live insects are found, consider the lentils to be "U.S. Sample grade."
- (2) Closely examine a representative portion of approximately 60-gram portion for small seeded lentils or 125-gram portion for large seeded lentils, divided out from the work sample.
  - (a) If no live insects are found in the sample, make no further check of the sample for insects.
  - (b) If two or more live insects are found, consider the lentils to be "U.S. Sample grade."
  - (c) If one live insect is found, closely examine the remainder of the work sample.
    - <u>1</u> If one or more live insects are found in the remainder of the work sample, consider the lentils to be "U.S. Sample grade."
    - If no live insects are found in the remainder of the work sample, do not consider the lentils to be "U.S. Sample grade."
- (3) Examine the lentils in the lot; i.e., the surface area of the lot and the area around the lot.
  - (a) If no live insects are found in, on, or about the lot, make no further check of the lot for insects.
  - (b) If two or more live insects are found, consider the lentils to be "U.S. Sample grade."
- b. When applicable, show "U.S. Sample grade on account of live insects" on the work record and in the "Remarks" section of the certificate, and grade the lentils "U.S. Sample grade."

#### 7.14 MOISTURE

Moisture is the water content as determined by an approved device according to procedures prescribed in FGIS instructions.

a. Upon request or when deemed necessary, determine moisture according to instructions in the Moisture Handbook.

NOTE: If a representative portion of the original sample of dockage-free lentils was not placed in a moisture-proof container at the time of sampling, promptly do so upon arrival at the laboratory. Seal the container with a friction or screw-top lid to preserve the moisture. The use of open containers, paper containers, and similar containers for holding moisture samples is prohibited.

b. Record the percent of moisture on the work record to the nearest tenth percent. If the moisture results exceed 14.0 percent, grade the lentils "U.S. Sample grade."

#### **7.15 ODOR**

- a. Determine odor on the basis of the lot as a whole or the representative sample as a whole.
  - (1) Off-odors (i.e., musty, sour, and commercially objectionable odors) are usually detected at the time of sampling.
    - (a) If there is any question as to the odor when the sample is being taken, put part of the sample into an airtight container to preserve its condition for further examination in the laboratory.
    - (b) Return the portion to the sample before other tests are made.
  - (2) A musty odor shall be any odor that is earthy, moldy, and ground-like. Do not confuse a burlap bag odor with a musty odor.
  - (3) A sour odor shall be any odor that is rancid, sharp, or acrid.

- (4) A commercially objectionable odor shall be any odor that is not normal to lentils and that, because of its presence, renders the lentils unfit for normal commercial usage; e.g., animal hides, fertilizer, oil products, skunk, smoke, fire-burnt, and decaying animal and vegetable matter odors.
- (5) Fumigant or insecticide odors are considered commercially objectionable odors if they linger and do not dissipate. When a sample of lentils contains a fumigant or insecticide odor that prohibits a determination as to whether any other odor(s) exists, apply the following guidelines:
  - (a) <u>Original Inspections</u>. Allow the work portion to aerate in an open container for a period not to exceed 4 hours.
  - (b) <u>Appeal and Board Appeal Inspections</u>. Allow unworked file samples and new samples to aerate in an open container for a period not to exceed 4 hours. The 4-hour aeration requirement does not apply when the original work portion was aerated and retained as the final file.
  - (c) <u>Final Action</u>. Consider the sample as having a commercially objectionable odor if the fumigant or insecticide odor persists based on the above criteria.
- b. When lentils are determined to be musty, sour, or have a commercially objectionable odor, record the type of odor on the work record and in the "Remarks" section of the certificate, and grade the lentils "U.S. Sample grade."

#### 7.16 HEATING

- a. Determine heating on the basis of the lot as a whole.
  - (1) When high temperatures develop in lentils as the result of excessive respiration, such lentils are heating.
  - (2) Heating lentils usually give off a sour or musty odor.

- (3) Care should be taken never to confuse lentils that are warm due to storage in bins, cars, or other containers during hot weather with lentils that are heating from excessive respiration.
- b. When applicable, show the term "Heating" on the work record and in the "Remarks" section of the certificate, and grade the lentils "U.S. Sample grade."

## 7.17 DEFECTIVE LENTILS (TOTAL)

Defects in lentils shall be scored in accordance with the order shown in section 601(c); and once an individual lentil is scored in a defective category it shall not be scored for any other defect but it shall remain as a part of the sample for purposes of determining the percentage of defects in the sample.

The categories of defective lentils shall be weevil-damaged lentils, heat-damaged lentils, damaged lentils, and split lentils.

- a. Determine defective lentils on a representative portion of approximately 60 grams for small seeded lentils and 125 grams for large seeded lentils.
- b. Score defects in the following order: weevil-damaged, heat-damaged, damaged, and split lentils.
  - (1) Once an individual lentil is scored, do not score it for any other defect but retain it as part of the sample for purposes of determining the percentage of other defects in the sample.
  - (2) Record the percent of each type of defect and the percent of total defects on the work record and the certificate to the nearest tenth percent. (If an individual factor result is 0.0 percent, no result is required to be shown.)

## 7.18 WEEVIL-DAMAGED LENTILS

<u>Weevil-Damaged Lentils</u>. Whole and pieces of lentils which are distinctly damaged by weevils or other insects.

a. Determine weevil-damaged lentils on a representative portion of approximately 60 grams for small seeded lentils and 125 grams for large seeded lentils.

- b. Consider as weevil-damaged:
  - (1) Lentils that contain or had contained a weevil, larva, or any other insect; and
  - (2) Lentils that have been stung by weevils or other insects where the damage extends into the cotyledon and is of a size equal to or greater than that shown on ILS Lentil 1.0.

NOTE: Lentils that have been "marked" by insects but where the sting does not penetrate the cotyledon are not considered as weevil-damaged lentils.

c. Record the percent of weevil-damaged lentils on the work record and the certificate to the nearest tenth percent.

#### 7.19 HEAT-DAMAGED LENTILS

<u>Heat-Damaged Lentils</u>. Whole and pieces of lentils which have been materially discolored as a result of heating.

- a. Determine heat-damaged lentils on a representative portion of approximately 60 grams for small seeded lentils and 125 grams for large seeded lentils.
- b. Lentils which have been materially damaged to an extent that the cotyledon has been discolored equal to or greater than that shown on ILS Lentil 1.3 A (Seedcoat On) or 1.3 B (Seedcoat Removed).
- c. Record the percent of heat-damaged lentils on the work record and the certificate to the nearest tenth percent.

#### 7.20 DAMAGED LENTILS

<u>Damaged Lentils</u>. Whole and pieces of lentils which are distinctly damaged by frost, weather, disease, heat (other than to a material extent), immature, or other causes, except weevil or material heat damage or are distinctly soiled or stained by nightshade, dirt, or toxic material.

- a. Determine damaged lentils on a representative portion of approximately 60 grams for small seeded lentils and 125 grams for large seeded lentils.
  - (1) <u>Frost Damaged Lentils</u>. Lentils that have been damaged by frost to the extent that the cotyledon or seedcoat has been discolored equal to or greater than that shown on ILS Lentils 1.2. Frost damaged lentils are usually characterized by a waxy textured cotyledon that may be yellow, green, or another color. Frost damaged lentils should not be confused with immature lentils or lentils that have naturally green-colored cotyledons.
  - (2) <u>Insect-Stung Lentils</u>. Lentils that have white "chalky" spots usually caused by Lygus bugs or similar insects. (See ILS Lentils 1.0.)
  - (3) <u>Mold Damaged Lentils</u>. Lentils which contain surface mold equal to or greater than that shown on ILS Lentil 1.5. (Lentils, which contain any amount of mold on the cotyledon shall be considered damaged.)
  - (4) <u>Damaged-By-Heat Lentils</u>. Lentils which have been damaged by heat to the extent that the cotyledon has been discolored equal to or greater than that shown on ILS Lentil 1.4 A (Seedcoat On) or 1.4 B (Seedcoat Removed).
  - (5) <u>Sprout Damaged Lentils</u>. Lentils which are sprouted and the sprout is equal to or greater than that shown on ILS Lentil 1.6.
  - (6) <u>Dirt and Grime Damaged Lentils</u>. Lentils with dirt and grime (including nightshade juice) adhering to the seedcoat equal to or greater than that shown on ILS Peas 1.1.
  - (7) <u>Worm-Eaten or Worm-Cut Lentils</u>. Lentils which have been chewed by insect larvae. Not to be confused with weevil-bored lentils containing insect webbing or filth. Any chewed lentil is considered damaged.

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- (8) <u>Immature Lentils</u>. Lentils that do not have a traditional lens-shaped profile due to immaturity. Immature lentils are characterized as having a thin, flat (wafer-like), wrinkled, and misshapen appearance. All three conditions (thin, wrinkled and misshapen) must be present for an inspector to consider a lentil an immature lentil. Lentils may also be discolored.
- b. Record the percent of damaged lentils on the work record and the certificate to the nearest tenth percent.

#### 7.21 SPLIT LENTILS

<u>Split Lentils.</u> Pieces of lentils which are less than three-fourths of a whole lentil, and lentils in which the cotyledons are loosely held together.

- a. Determine split lentils on a representative portion of approximately 60 grams for small seeded lentils and 125 grams for large seeded lentils.
- b. Record the percent of split lentils on the work record and the certificate to the nearest tenth percent.

#### 7.22 SKINNED LENTILS

<u>Skinned Lentils</u>. Lentils from which three-fourths or more of the seedcoat has been removed.

- a. Determine skinned lentils on a representative portion of approximately 60 grams for small seeded lentils and 125 grams for large seeded lentils.
- b. Skinned lentils shall be lentils that are scraped or skinned to an extent equal to or greater than that shown on ILS Lentil 1.7.
- c. Record the percent of skinned lentils on the work record and the certificate to the nearest tenth percent.

#### 7.23 CONTRASTING LENTILS

<u>Contrasting lentils</u>. Lentils that differ substantially in size or color from the predominating lentil type.

- a. Determine contrasting lentils on a representative portion of approximately 60 grams for small seeded lentils and 125 grams for large seeded lentils.
- b. For sizing purposes only obvious differences are to be considered.
- c. Color, as used in this definition, is limited to the lentil's natural seedcoat color and excludes the mottling that may be present on some seedcoats and discolorations that may be associated with aging, or handling/storage practices.
- d. Damaged contrasting lentils function as damaged lentils and contrasting lentils.
- e. Record the percent of contrasting lentils on the work record and the certificate to the nearest tenth percent.

#### 7.24 FOREIGN MATERIAL

<u>Foreign Material</u>. All matter other than lentils, including detached seedcoats, which cannot be readily removed in the proper determination of dockage.

<u>Stones</u>. Concreted earthy or mineral matter, and other substances of similar hardness that do not readily disintegrate in water.

- a. Determine foreign material on a representative portion of approximately 60 grams for small seeded lentils and 125 grams for large seeded lentils.
- b. Record the percent of foreign material on the work record and the certificate to the nearest tenth percent.

#### 7.25 INCONSPICUOUS ADMIXTURE

<u>Inconspicuous Admixture</u>. Any seed which is difficult to distinguish from a lentil; including, but not limited to, <u>Vicia sativa</u>.

a. Determine inconspicuous admixture on a representative portion of approximately 60 grams for small seeded lentils and 125 grams for large seeded lentils.

b. Record the percent of inconspicuous admixture on the work record and the certificate to the nearest tenth percent.

## 7.26 SIZE REQUIREMENTS

<u>Large Lentils</u>. Lentils of the class Lentils of which not more than 3.0 percent of the lentils will readily pass through the 15/64-inch round-hole sieve.

<u>Small Lentils</u>. Lentils of the class Lentils of which 95 percent or more will readily pass through a 15/64-inch round-hole sieve, not less than 80 percent will readily pass through a 12/64-inch round-hole sieve, and not more than 3.0 percent will readily pass through the 9/64-inch round-hole sieve.

- a. Determine the special grades "Large Lentils" and "Small Lentils" on a representative portion of approximately 125 grams.
  - (1) Size lentils by sieving the representative portion with the appropriate size sieve (see table 2).

<u>Table 2 - Prescribed Sieves</u>		
Special Grade	Sieves	
Large Lentils	15/64 - inch Round-Hole	
Small Lentils	15/64 - inch Round-Hole 12/64 - inch Round-Hole 9/64 - inch Round-Hole	

- (2) Nest the appropriate size sieve(s) on top of a bottom pan.
- (3) Place the sieve(s) in a mechanical grain sizer and set the timer to 20.
- (4) Put the representative portion in the center of the sieve and actuate the sizer.

- (5) Return the lentils remaining in the perforations of the sieve to the portion that remains on top of the sieve.
- (6) Determine the percent of lentils that pass through the sieve(s).

NOTE: If a mechanical sizer is unavailable, hold the sieves and bottom pan level and, using a steady motion, move the sieves from right to left approximately 10 inches, and return from left to right to complete one sieving operation. Repeat this operation twenty times.

- b. Record the percent of lentils that pass through the sieve(s) and the size of sieve(s) used in the determination on the work record.
  - (1) If not more than 3.0 percent of the lentils pass through a 15/64-inch round-hole sieve, show the special grade "Large Lentils" on the work record and on the grade line of the certificate.
  - (2) If 95 percent or more of the lentils pass through a 15/64-inch round-hole sieve, not less than 80 percent pass through a 12/64-inch round-hole sieve and not more than 3.0 percent pass through a 9/64-inch round-hole sieve, show the special grade "Small Lentils" on the work record and on the grade line of the certificate.

#### **7.27 COLOR**

<u>Good Color Lentils</u>. Lentils that are practically free from discoloration and have the uniform natural color and appearance characteristics of the predominating lentil type.

<u>Fair Color Lentils</u>. Lentils that are lightly to moderately discolored from storage or other causes to the extent they cannot be considered of good color.

<u>Poor Color Lentils</u>. Lentils that are severely discolored from storage or other causes to the extent they cannot be considered of fair color.

Color shall be determined after the removal of dockage, defective lentils, and foreign material.

- a. Determine color on a representative portion of approximately 60 grams for small seeded lentils and 125 grams for large seeded lentils after the removal of dockage, defective lentils, and foreign material.
  - (1) Available type samples or interpretive line prints serve as the basis for this general appearance assessment.
  - (2) Lentils that are discolored by dust or a slight amount of dirt, which can be removed by processing methods, shall be considered as "good color."

NOTE: One of the most common causes of discoloration of lentils is excessive heat, so-called "sunburned lentils" which are characterized by dark brown or reddish casts. Long storage may also produce discoloration and prevent the lentils from being considered of good color.

b. When dockage-free lentils are determined to be other than "good color," record this information on the work record and in the "Remarks" section of the certificate. Lentils that are "fair" in color shall grade no higher than U.S. No. 2. Lentils that are "poor" in color shall grade no higher than U.S. No. 3.

#### 7.28 BROKEN GLASS

- a. Determine broken glass on the basis of the lot as a whole and/or the representative sample as a whole.
- b. The presence of <u>any</u> broken glass (regardless of the size or amount) in the lot as a whole, work sample, or sample as a whole, shall be sufficient evidence of glass.
- c. When applicable, show the term "Broken glass" on the work record and in the "Remarks" section of the certificate, and grade the lentils "U.S. Sample grade."

#### 7.29 METAL FRAGMENTS

a. Determine metal fragments, such as metal filings or metal shavings, on the basis of the lot as a whole and/or the representative sample as a whole.

- b. Sufficient evidence of metal fragments shall be:
  - (1) Two or more metal fragments in the lot as a whole or the work sample; or
  - (2) One metal fragment in the work sample and one or more in the file sample.
- c. When applicable, show the term "Metal fragments" on the work record and in the "Remarks" section of the certificate, and grade the lentils "U.S. Sample grade."

## 7.30 DISTINCTLY LOW QUALITY

<u>Distinctly Low Quality</u>. Whole lentils which are obviously of inferior quality because they are stained by an unknown foreign substance or because they otherwise contain a known toxic substance(s) or an unknown foreign substance(s) or because they are in an unusual state or condition, and which cannot be graded by use of the other grading factors provided in the standards.

- a. Determine distinctly low quality on the basis of the sample as a whole.
- b. Lentils that are obviously affected by unusual conditions which adversely affect the quality of the lentils, such as animal excreta or other filth, two or more pieces of an unknown foreign substance, or treatment with a fungicide, shall be considered to be "distinctly low quality."
- c. When applicable, show the statement "Distinctly low quality on account of (<u>cause or reason</u>)." on the work record and in the "Remarks" section of the certificate, and grade the lentils "U.S. Sample grade."

Attachment 1
PEA AND LENTIL HANDBOOK
Chapter 7
Dockage-Free Lentils
12/31/02

## GRADES, GRADE REQUIREMENTS, AND GRADE DESIGNATIONS

Cualina Factors	Grades U.S. Nos.		
Grading Factors	1	2	3
Defective Lentils			
Total 1/	2.0	3.5	5.0
Weevil-Damaged Lentils	0.3	0.8	0.8
Heat-Damaged Lentils	0.2	0.5	1.0
Foreign Material			
Total 2/	0.2	0.5	0.5
Stones	0.1	0.2	0.2
Skinned Lentils	4.0	7.0	10.0
Contrasting Lentils 3/	2.0	4.0	>4.0
Inconspicuous Admixture	0.5	0.8	1.0
Minimum Requirements for Color	Good	Fair	Poor

## U.S. Sample grade shall be lentils which -

- a. Do not meet the requirements for the grades U.S. Nos. 1, 2, or 3; or
- b. Contain more than 14.0 percent moisture, live weevils, or other live insects, metal fragments, broken glass, or a commercially objectionable odor; or
- c. Are materially weathered, heating, or distinctly low quality.
- 1/ Defective lentils total is weevil-damaged, heat-damaged, damaged, and split lentils combined.
- 2/ Foreign material total includes stones.
- 3/ Lentils with more than 4.0 percent contrasting lentils shall grade no higher than a U.S. No. 3.